REMARKS/ARGUMENTS

This Amendment is in response to the Office Action mailed October 29, 2007. Claims 1-32 are pending in this application. This Amendment amends claims 1, 2-7, 9-12, 17, 18, 22, 23, 25, 26, 30 and 32, and cancels claims 21 and 29. No claims have been added herein. Reconsideration of the rejected claims is respectfully requested.

Applicant-Initiated Interview

Applicants thank the Examiner for granting an interview on April 2, 2008, where arguments were discussed generally. More particularly, Applicants discussed that the λ (forecasted mean demand) excluded one or more actual sales values at a sellout and that the Bell reference failed to teach or suggest the claimed features.

I. Objection to the Claims

Applicants thank the Examiner for identifying the informalities in the claims. The claims have been amended accordingly. Applicants therefore respectfully submit that the objection with respect to the claims be withdrawn.

II. Rejection under 35 USC § 103, Bell in view of Artto

Claims 1-32 are rejected under 35 U.S.C. §103(a) as being unpatentable over Bell ("Forecasting demand variation when there are stockouts," 2000; "Adaptive Sales Forecasting with Many Stockouts," 1981; and "A new Procedure for the Distribution of Periodicals," 1978) (hereinafter "Bell") in view of Artto and Pylkkanen ("An effective procedure for the distribution of magazines", 1999) (hereinafter "Artto"). Claim 1 is allowable as Bell and Artto either alone or in combination, do not teach or suggest each and every element of claim1. For example, claim 1 recites in part:

> determining a subset of sales values of the time series of actual sales values over the observation period for the perishable consumer item at the outlet, the subset of sales values excluding the actual sales value at at least one occurrence of the sellout, the occurrence of the sellout being determined by comparing a sales value of the time series of sales values against a corresponding draw quantity of a time series of draw quantities;

applying a statistical seasonal causal time series forecasting model of count data on the subset of sales values to determine a forecasted mean demand value for the perishable consumer item at the outlet at the occurrence of the sellout; and

estimating the hidden demand at the occurrence of the sellout using a single parameter probability distribution conditioned on the forecasted mean demand value. (emphasis added).

Bell does not teach or suggest "determining a subset of sales values… the subset excluding the actual sales value at at least the occurrence of the sellout," "applying a statistical seasonable causal time series forecasting model of count data on the subset…to determine a forecasted mean demand value," and "estimating the hidden demand…using a single parameter probability distribution conditioned on the forecasted mean demand value," as recited in claim 1. Applicants submit that at least these features are not taught or suggested by Bell.

Bell describes that if a stockout is observable at a sale of P_t units at a retailer having parameters μ_t (Mean Demand) and m_t, then the expected demand conditional on a stockout is $S'_t = \mu_t + E(U')m_t$ where E(U') is computed from (4), given $U = (P_t - \mu_t/m_t)$, where the U is the distribution level. (Bell, p.868).

Moreover, Bell also describes

In summary, the stockout adjustment is made as follows:

if $S_t = P_t$: (1) compute $U_t = (P_t - \mu_t)/m_t$,
(2) use this value of U_t to compute $E(U_t')$ from (4)
(3) compute $S_t' = \mu_t + E(U_t') \cdot m_t$,
(4) use S_t' in place of S_t in equation (2); (Bell, p.869).

It is asserted in the office action that Bell estimates demand for the stockout period using an approximation of the standard normal distribution, citing to equation (4) and previous derivations of Bell. It is further asserted that periods of stockout are excluded from the demand estimation by smoothing the time series sales data over non-stockout periods. (Office Action, p. 5). Applicants respectfully disagree.

Applicants submit that Bell does not teach "subset of sales values excluding the actual sales value at at least one occurrence of the sellout…the subset of sales values used to determine a forecasted mean demand value," as recited in claim 1. As recited in claim 1, the forecasted mean demand value is determined by excluding the actual sales value at the occurrence of one or more sellouts. Bell recognizes that a stockout adjustment is necessary and describes that the stockout adjustment includes computing an expected demand conditional on a stockout having

occurred (S'_t) and using this S'_t value in place of "sales" when a stockout happens. (Bell, 2000, p. 359). This expected conditional demand expressly considers the stockout at P_t. For example, Bell states that S'_t is computed given that $U = (P_t - \mu_t/m_t)$. Thus, the value of S'_t does not exclude the actual sales value at the stockout P_t. (Bell, 1981, p. 868).

Additionally, Applicants submit that an adjusted value for the sales in period t of the stock out (S_t) are indeed included in the exponential smoothing to compute the base demand. Bell describes that in the occurrence of stockout, S'_t is used in place of S_t in equation (2), where base demand is computed using exponential smoothing. Accordingly, Bell teaches that, first, the quantity at the period of the stockout where $S_t = P_t$ is adjusted to S'_t, and second, the adjusted sales value S'_t for the stockout is then substituted for S_t for computing the base demand. Thus, Bell does not exclude the actual sales values from the period of the stockout from the demand estimation, as asserted in the office action.

Accordingly, Bell does not teach " subset of sales values excluding the sales value at at least the occurrence of the sellout," as recited in claim 1. Likewise, Bell also does not teach or suggest, "applying a statistical seasonable causal time series forecasting model of count data on the subset…to determine a forecasted mean demand value," as recited in claim 1. Thus, Bell does not render claim 1 obvious.

Artto does not make up for the deficiencies in Bell with respect to these claims. Artto is cited as teaching a forecasting model which considers seasonality and causality. (Office Action, p. 4). Even assuming that Artto teaches what is cited and that there is a motivation to combine, this teaching does not make up for the deficiencies in Bell with respect to this claim. As such, Artto does not render obvious Applicants' claim 1 either alone, or in combination with Bell. As claim 1 is allowable, dependent claims 2-8 are also patentable for at least the same rationale. Neither does Bell nor Artto provide motivation for providing such functionality, and even if the references were combined for sake of argument the result would not arrive at the invention recited in Applicants' claim 1.

Furthermore, the combination of Bell and Artto do not teach "estimating the hidden demand at the occurrence of the sellout using a single parameter probability distribution

conditioned on the forecasted mean demand value," as recited by claim 1. It is recognized in the office action that "Bell does not expressly teach estimating the hidden demand at the occurrence of the sellout using a single parameter probability distribution." (Office Action, p. 5). It is asserted in the office action that "a single parameter probability distribution" is taught by Wecker, Conrad, and Bell 1978, for which it is suggested that demand is capable of being modeled by Poisson and that the Poisson distribution has particular application to forecasting demand in the presence of stockouts. (Office Action, p. 6). Applicants respectfully disagree.

The references make no mention or suggestion of "using a single parameter probability distribution," such as Poisson, is "conditioned on the forecasted mean demand value," as recited in claim 1. The Wecker reference describes using a normal distribution, and states that "the normal distribution assumption is not crucial to what follows and that essentially the same results can be achieved with alternative distributional assumptions." (Wecker, p. 1048). The Conrad references describes that demand may follow a Poisson distribution and that for high demand, as in the newsagent problem, the normal distribution is used. (Conrad, pgs.124 and 125). Bell 1978 also states that the normal distribution is a good approximation for a Poisson distribution with a large parameter. (Bell 1978, p. 429). None of these references make any mention or suggestion that the forecasted mean demand value excludes an actual sales value at the occurrence of the sellout and conditioning the single parameter probability distribution on the forecasted mean demand value. Nor do these references make any mention or suggestion that the provides accurate modeling for predicting demand at a stockout. Essentially, the references do not make any correlation between stockout occurrences and using Poisson as a solution, as suggested in the office action. Thus, the Wecker, Conrad, and Bell 1978 references do not render obvious Applicants' claim 1 either alone, or in any combination with Bell and Artto.

Unexpected Results

For purposes of argument, even if the prior art can be construed or interpreted to teach or suggest various features of claim 1, Applicants respectfully submit that the combination as recited in the claim is non-obvious. For example, Applicants respectfully submit that the feature of "estimating the hidden demand at the occurrence of the sellout using a single parameter

probability distribution conditioned on the forecasted mean demand value," as recited in claim 1 is non-obvious because unexpected results are produced. For example, Applicants direct the attention of the Examiner to the application, which states, in part, "it should be noted that the approach in accordance with the present invention precludes negative demand values which are inconceivable but theoretically possible in the case of the...assumption that demand can be modeled by a Normal distribution." (Application, p. 6, lines 23-26). The exclusion of negative demand values, as produced by the single parameter probability distribution as recited in claim 1 thus provides greater accuracy of demand forecasting for perishable consumer items.

Failure of Others

Furthermore, for purposes of argument, even if the prior art can be construed or interpreted to teach or suggest various features of claim 1, Applicants respectfully submit that the combination as recited in the claim is non-obvious. For example, Applicants respectfully submit that the Bell 2000 reference attempted and specifically failed at finding a viable solution for estimating demand at the occurrence of a sellout. Bell 2000 reference provides a solution to the problem of accounting for stockouts in demand forecasting. Bell 2000, like the references cited, describes the use of a normal distribution as a model for demand. After simulation testing, Bell recognized that the normal distribution was insufficient in the context of correcting for stockouts. More particularly, Bell 2000 describes

> The results reported above were derived from simulation using normally distributed demand with fixed parameters. Additional simulation experiments were performed varying the parameters (μ_t and σ_t, t [1,500]) over time. Similar results, showing a clear benefit for the improved stockout adjustment method were obtained as long as the distributions of μ_t and σ_t were stationary. Experiments which included a trend in μ_t and/or σ_t produced equivocal results. In particular, neither method performs well when mean demand is increasing linearly over time, suggesting the opportunity to develop new stockout adjustment procedures for the case of a linear trend in mean demand. (Bell 2000, pgs, 362-363).

Accordingly, Bell did not contemplate the use of Poisson in the context of correcting for stockouts, and merely suggested that new stockout adjustment procedures should be developed. Applicants direct the attention of the Examiner to specification, which recognizes the conventional approach of using the normal distribution presupposes that the demand is stationary. Unlike the prior art, the specification describes that the "demand process for a perishable consumer item at an outlet has a random but non-stationary nature." (Application, p.

5, lines 25-29). The use of a single parameter probability distribution, such as Poisson, was not recognized as a solution for demand forecasting at the occurrence of a sellout. Thus, the subject matter recited in claim 1 involves more than a mere substitution of one element or another.

Applicants submit that independent claims 9, 17, and 25 also recite features that are not taught or suggested by Bell and should be allowable for at least the same rationale as discussed with respect to claim 1. Claims 10-16 depend from independent claim 9 and thus derive patentability at least therefrom. Claims 18-24 depend from claim 17and thus derive patentability at least therefrom. Claims 26-32 depend from claim 25 and thus derive patentability at least therefrom. Applicants therefore respectfully request that the rejection with respect to the pending claims be withdrawn.

III. Amendment to the Claims

Unless otherwise specified, amendments to the claims are made for purposes of clarity, and are not intended to alter the scope of the claims or limit any equivalents thereof. The amendments are supported by the specification and do not add new matter.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

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